



Researcher at KMPC in Seoul.



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▲ Top: Researcher at the Korea Mouse Phenotyping Center (KMPC) in Seoul. Bottom: KMPC is heading up the South Korean government's Model Animal Bioresource Cluster.

A WEALTH OF BIORESOURCES

The Korea Mouse Phenotyping Center (KMPC) has taken a leading role in managing **SOUTH KOREA'S MODEL ANIMAL BIORESOURCES**.

Je Kyung Seong can still remember what it felt like to be the first lab-animal professor at a medical school in South Korea. In addition to pursuing his own research, he had to set up a campus-wide infrastructure for laboratory animals, because it didn't exist. "I very quickly realized, it was really just too much for one guy to cover," he laughs.

More than 26 years later, Seong is now bringing his expertise as the director of the Korea Mouse Phenotyping Center (KMPC) and a professor at Seoul National University to his role in leading the South

Korean Ministry of Science and ICT's Model Animal Bioresource Cluster.

Bioresources include living organisms like model animals, human biological samples, cell lines, microorganisms, viruses, wild and domestic animals, and chemical libraries with research data related to materials' characteristics and efficacies. The South Korean government has established the national infrastructure to efficiently manage these bioresources and data derived from them, to enhance research reliability and reproducibility.

Specifically, 274 formerly

separate bioresource banks have been reorganized into 14 bioresource clusters, with a designated central bank in each cluster. Each cluster plans to build a web portal aimed at helping researchers easily locate relevant information and research data.

One of these clusters is the Model Animal Bioresource Cluster. "The mouse programme has been well established in South Korea, compared with other animal models," explains Seong, "and last year, the government decided it wanted to bring other model animal resources in line with the same

high standards," he says.

Part of this levelling up will include boosting the Korean Animal Model Archive (KAMA), an online portal which will include five genetically modified models including: mouse, *Xenopus* (African clawed frog), *Drosophila*, zebrafish, and *C. Elegans*, as well as three non-modified models: the minipig, marmoset, and non-human primates. The archive will have a user-friendly search function by disease and by gene name for domestic model animal resource information.

A MODEL INSTITUTION FOR BIOBANKS

KMPC was established for the purpose of developing genetically engineered mice, mouse phenotype analysis, and sharing mouse resource information. It has also been actively involved in the International Mouse Phenotyping Consortium (IMPC) as the only institutional member in South Korea.

Due to its expertise in mouse resources, phenotype analysis, and data collection and management, the Ministry of Science and ICT designated KMPC as the principal investigator organization for the model animal cluster.

The centre had previously consolidated mouse phenotyping resources and other research data through their web platform, the Mouse One Portal (MOP). Through MOP, researchers and customers can search

for specific genes of interest, purchase already established genetically engineered mice, or custom design a new mouse. KAMA seeks to draw upon this rich infrastructure, with the help of Seong and KMPC, along with members of other model animal communities.

DOMESTIC AND INTERNATIONAL RESEARCHERS WILL BE ABLE TO ACCESS WELL-ARCHIVED AND INDEXED BIORESOURCES WITH EASE.

KMPC has been also working on applying a research resource identification number into KAMA, so each bioresource will be also traceable in KAMA. This will allow researchers to determine in KAMA in which

bioresource each publication is utilized and the extent to which the bioresource is reliable. The transparent tracking system will help enhance reproducibility in model animal research in the long term.

THE BUZZ ABOUT BIORESOURCES

The Korea *Drosophila* Resource Center (KDRC) is another member of the model animal cluster. Greg Seong Bae Suh is one of the KDRC team, and he initiated K-GUT, an ongoing project that archives the expression patterns of *Drosophila* GAL4 lines in the gastrointestinal tract. It currently stands as one of KDRC's most notable initiatives.

"We thought we were aligned with the model animal cluster," recalls Suh, "so we applied for financial support from the cluster and were put in charge of the *Drosophila* branch that

CASE STUDY: MOVING BETWEEN MODELS

Greg Seong Bae Suh has long been interested in the nature of the sensory system and its interaction with metabolism. While at New York University, his laboratory launched the new study of nutrient sensing — a 'sixth sense' through which the body can detect and respond to the nutrient content of foods — in the fruit fly *Drosophila*. His particular interest is glucose-sensing cells, which are able to detect the difference in calorific content of two foods that otherwise taste identical. D-glucose and L-glucose are both equally sweet, but L-glucose has no calories. When flies and mice are well fed, they show no preference for either D-glucose or L-glucose. But when they are starved overnight, both flies and mice prefer the higher-calorie D-glucose. A similar phenomenon has been seen with protein sensing.

Having started his exploration of these nutrient-sensing neurons in flies, the Suh laboratory has since moved to the Korea Advanced Institute of Science and Technology (KAIST) where Suh is continuing his work both in flies and in mice. For that, his lab and the community would need mice that are engineered to have different expression patterns of CRE lines in the gastrointestinal tract, which Suh and colleagues have identified as being linked with these nutrient-sensing cells. That's where KMPC comes in.

Given the need for bioresources such as engineered and phenotyped flies, mice, zebrafish, *C. elegans* and others, Suh fully appreciates the importance of an institution such as KMPC, and the model animal cluster. "It has been well integrated into the world scientific community so we can contribute to progress not only in South Korea but also worldwide."

would further inaugurate new resource programmes."

It's not just access to the model animal cluster resources that Suh values, as that access is available to researchers outside the membership. Suh particularly appreciates the opportunity to discuss potential projects with other members, and the ability to integrate their resources and make them available to the international community.

KAMA is a resource that will ensure that researchers, both domestic and international, will be able to access well-archived and indexed bioresources with ease — and avoid the difficulties Seong had as a young scientist. ■

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